Focus on International Joint Commission Activities

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FOCUS
On International Joint Commission Activities

CONCERNS EXPRESSED FOR THE GREAT LAKES

More than 800 attend Commission's Biennial Meeting to urge greater action to restore Great Lakes water quality

Hamilton Harbour. Credit: Frank Bevacqua

by Sally Cole-Misch

Zero discharge of persistent toxic substances; involvement by municipal governments to protect water quality; incorporating land use planning elements into remedial action plans; the invasion of zebra mussels; and shifting from reactive to proactive attitudes in all programs developed to restore and protect the Great Lakes Basin Ecosystem. These and many other issues were presented by conference participants to the International Joint Commission (IJC) during the 1989 Biennial Meeting on Great Lakes Water Quality.

Held at the Convention Centre in Hamilton, Ontario from October 10 through 13, 1989, the meeting brought together more than 800 citizens, government and agency representatives, scientists and media persons to discuss the state of the Great Lakes and efforts needed to restore the quality of the lakes. The Commission convenes these meetings every two years for presentation of the findings of its two Great Lakes advisory boards, the Water Quality and Science Advisory Boards, and to provide an opportunity to discuss

Inside...

these findings and other issues in a public setting. A live interactive television program on cable and a public meeting on Great Lakes fluctuating levels on Saturday, October 14 is reported on in the levels update, starting on page 11.

Participants were welcomed by Hamilton Mayor Robert Morrow and entertained by the singing group Raspberry Jam in an opening reception Wednesday evening. Canadian Commissioners E. Davie Fulton and Robert Welch and US Commissioners Gordon Durnil and Donald Totten then listened to presentations by the Water Quality Board (WQB), Science Advisory Board (SAB) and more than 125 citizens presentations Thursday and Friday morning. In all, the Commission devoted more than ten hours to receiving citizen statements over the two days.

Joyce McLean, Great Lakes coordi-

International Joint Commission
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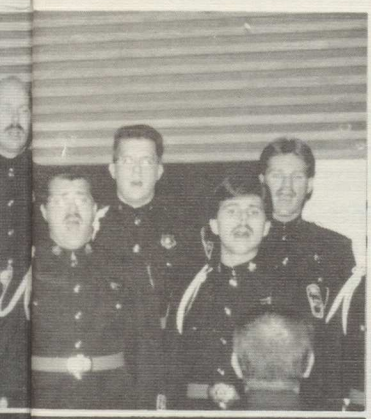
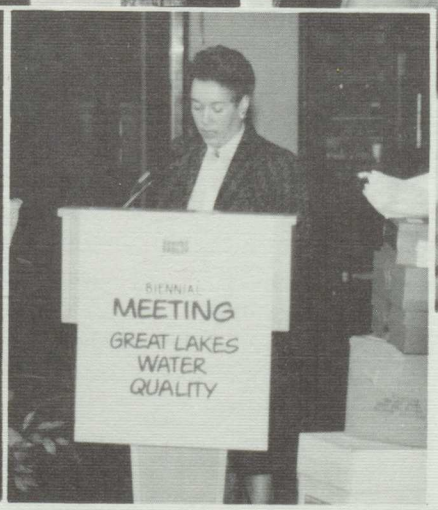
Photos by Frank Bevacqua and Yvan Gagné

IJC Commissioners, left, listened to presentations by the Water Quality and Science Advisory board co-chairs, below, as well as (following clockwise) MP Sheila Copps, Joyce McLean of Greenpeace, Kingston, Ontario Mayor Helen Cooper and Chief Lloyd Benedict, bottom left.





Hamilton Mayor Robert Morrow, middle left, welcomed meeting attendees to the city, and the region's Police Chorus sang the national anthems before lunch Thursday, middle. Raspberry Jam entertained during the opening reception, lower left, and Greenpeace provided a brief dance introduction before the keynote speech Thursday by Joyce McLean, above.

nator for Greenpeace International, began the citizen presentations in her luncheon address Thursday. McLean reviewed the Commission's history in identifying pollution problems in the basin, and emphasized citizens' frustration with the lack of progress towards zero discharge of persistent toxic substances into the Great Lakes ecosystem.

This concern was echoed by elected officials and citizens later during the public presentation sessions. Whether presentors discussed specific issues such as developing remedial action plans (RAPs), human health, contaminated sediments or atmospheric pollution or discussed general progress under the Agreement, one major theme seemed to tie their comments together. Citizens said they are extremely frustrated by what some termed a "lack of commitment, leadership and action" by the governments, industries and individuals to implement the goals of the Agreement, which they believe holds the answers to eliminating pollution from the ecosystem. They are willing to change their lifestyles in order to lessen the amount of pollution generated, but they want industries and businesses to be held accountable to change their practices as well.

Many presentors felt that RAPs should be made legally binding to ensure implementation in all Areas of Concern, and that municipal governments should be brought more formally into the process in order to develop local actions to meet Agreement objectives. Native people also want to be more centrally involved in Great Lakes issues. Many citizens thanked the Commission for the opportunity to express their views and concerns, and encouraged the IJC to urge governments to take stronger actions to implement the Agreement's provisions.

Similar messages were voiced in the recommendations presented from three concurrent workshops held Friday morning. Participants in the human health workshop learned that researchers are finding subtle, yet alarming long-term effects in several wildlife species, particularly in the offspring of adults who ingested significant levels of toxic compounds. However, most scientific research on humans focuses on cancer and mortality rates rather than the developmental effects found in some species, including humans. They concluded that new research is needed which considers these effects,

including the synergistic impacts of chemicals on a variety of species. Most importantly, it was noted that individuals' lifestyles are responsible for generating much of the toxic substances present in our environment. Thus, humans must reconsider what and how products are created, packaged and used, and change these practices to reflect the value we place on a healthy environment, for ourselves and for other species.

Following keynote presentations, participants from the sustainable futures workshop broke into workgroups to discuss three issues: agricultural chemicals, energy and waste reduction. In the first workgroup, participants concluded that more work is needed to identify and control urban and rural nonpoint pollution sources, with particular attention directed to sources of groundwater contamination from agricultural chemicals and fertilizers.

The energy workgroup encouraged the Commission to convene a workshop on the linkages between energy and environmental quality, which could include consideration of opportunities for greater energy efficiency in the basin. The waste reduction group expressed its concern about incineration as a primary method to reduce waste, noting that large incinerators may discourage development of other, more benign methods such as recycling. It recommended that the Commission develop a waste reduction strategy for governments, which could emphasize municipal governments as key implementors of waste management technologies and educating youth about various conservation and recycling methods.

Another workshop focused their discussions on the successes of RAPs and the obstacles that must be overcome to ensure implementation of each plan's provisions. Successes include greater cooperation between all sectors of the areas' communities, including public participation and commitment to the plan; consensus has been reached on plan principles and goals; greater emphasis is being placed on controlling pollution at its source; and greater financial and human resources are being devoted to the RAP process.

Several obstacles were also identified, including the difficulty in defining each Area of Concern's beneficial uses and how they are impaired; obtaining greater communication with those involved in other areas to learn from their experiences; maintaining public, political and financial support over the long term; and ensuring that each RAP includes a specific implementation strategy which identifies what and when actions will be completed, how actions will be funded, and who is responsible for carrying out these activities.

In addition to these presentations, the IJC's two advisory boards presented their 1989 report findings Thursday morning. US Co-Chair Valdas Adamkus and Canadian Acting Co-Chair William Steggles summarized the WQB's findings, highlighting the following points:

- While loadings of phosphorus and toxic substances were greatly reduced in the 1970s as a result of the Agreement, contaminant levels in water, fish and birds stopped declining in the 1980s. There are now no consistent trends, and concentrations of toxics are still unacceptably high in all sectors of the ecosystem.
- The Governments' progress reports, as called for in the amended 1978 Agreement, lack details and data. As a result, the Board is unable to provide a comprehensive assessment of progress under the Agreement.
- RAPs under development in each of the 42 Areas of Concern must place emphasis on controlling pollution at its source. The plans are a step in the direction towards developing and implementing an ecosystem approach in the Great Lakes basin; as such, they are driving a new agenda to redirect government programs and policy for the future.
- Citizens play the central role in determining what remediation programs will be developed, because public will can ensure that human and financial resources are made available to accomplish Agreement goals.

SAB Co-Chairs Dr. Al Beeton and Dr. Jack Vallentyne and other Board members focused their report presentation on two major areas:

- **Human Health** The SAB recommended that the IJC encourage governments to carry out a comprehensive binational investigation concerning the significance, nature and extent of human exposure to toxic chemicals. Because of shorter generational times, fish and wildlife populations are the "miner's canaries" for the Great Lakes ecosystem, and they have already signaled danger to us as humans. The Board concludes that the existing framework for detecting and analyzing the effects of toxic chemicals is insufficient to safeguard human and ecosystem health, and proof of harm should not be required to prevent contamination. The Board

urges that use of certain toxic chemicals should be stopped immediately.

- **Ecosystem Health** As many sectors of the ecosystem have been irreversibly changed, it may be impossible to totally restore these areas, as called for in the Agreement. In order to stop further ecosystem degradation, the Board recommends increased efforts to anticipate and prevent pollution from entering the system, while continuing cleanup of pollution already present. Devices and methods should be developed to prevent exotic species from invading the Great Lakes (see related article, page 15).

At least 3,000 spills occur annually in the basin, and major revisions are needed in controls for the transportation system to prevent further contamination of the ecosystem. Finally, the SAB recommends to the Commission that a binational, regional pilot project be completed in order to anticipate and prevent potential problems resulting from climate change. Such a project could serve as an international model for other regions to use in preventing future environmental damage.

In response to the reports of its two advisory boards and recognizing the need for a broader range of input to its activities, the Commission announced two initiatives at the Biennial Meeting it will undertake over the next two years. The first is the formation of a special task force to assist in defining the Commission's data and information needs, to ensure that this material is received from governments and that the Commission is responsive to its obligations under the Agreement. Secondly, the Commission will organize a series of roundtable discussions on specific issues of concern to the Great Lakes basin. Representatives from business, labour, academia, citizens' organizations and government will be invited to participate to continue the broad level of consultation between the Commission and residents of the region. Further details of both initiatives will be provided in future issues of *Focus*.

For copies of the WQB and SAB's 1989 reports or for more information about the biennial meeting, contact Information Services in the IJC's Regional Office, 100 Ouellette Avenue, Eighth floor, Windsor, ON N9A 6T3 or P.O. Box 32869, Detroit, MI 48232. In Canada call (519)256-7821 and in the US call (313)226-2170.

Gordon Durnil Joins Commission as US Chair

Gordon K. Durnil of Indiana was confirmed by the US Senate on October 7, 1989 to become the International Joint Commission's new United States Chair. Mr. Durnil earned a law degree from the Indiana University School of Law in 1965, and has experience in sales, small business management, government and the general practice of law.

Between 1981 and early 1989, Durnil served as Indiana State Chair for the Republican Party. As such, he played a key management role in 34 statewide campaigns as well as serving as chairperson for senatorial and national campaign committees. He has supervised thousands of volunteers in election campaign cycles over the past two decades, and has experience in the fields of advertising and public relations.

Commissioner Durnil also serves as director and finance chair of the Indiana Ronald McDonald House, is a member of the American Association of Political Consultants, and is president of his high school alumni association. He is married, the father of two grown children and lives in Indianapolis, Indiana.

New IJC U.S. Chair Gordon Durnil welcomes attendees to the Biennial Meeting. Credit: Frank Bevacqua

Students learned about Great Lakes Issues from speakers like Dr. Jack Vallentyne, a.k.a. Johnny Biosphere, in morning sessions. Below, students dicussed their vision of the future.

Credit: Yvan Gagné

Students Develop Vision for Great Lakes Future

Almost 250 students and teachers from the Hamilton-Wentworth-Halton region participated in a day-long workshop on October 10, 1989 to learn about issues affecting the Great Lakes, and how they can make a difference in the lakes' future. The workshop was organized by the IJC, in cooperation with a local education steering committee, as part of a community awareness program the Commission sponsors with each biennial meeting. Steering committee members included Ed Dominichetti, Halton Separate School Board; Bud Fisher, Wentworth County Board; Lino Fuciarelli, Hamilton-Wentworth Separate School Board; John Henry, Hamilton Board; and John Pettit, Halton Board of Education.

The region's five school boards invited five grade 13 students from each area high school to participate in the day's events. Five students and one teacher from the Ottawa Board of Education also participated. The students and teachers chose two of ten concurrent information sessions to attend in the morning; the sessions addressed a wide variety of issues facing the lakes, from general discussions on toxics in wildlife, levels and the greenhouse effect to specific topics such as the Hamilton Harbour remedial action plan and how citizens can help to restore and protect the Great Lakes.

The conference divided into 50 groups of five students each to develop their own vision of the future for the Great Lakes region in the afternoon, based on what they had learned in the morning sessions. Tom Green and Patty Ann Ryan of *Visions 2020*, an educational program being developed for Ontario schools, assisted the students with this project.

Each group produced posters that depicted their own unique vision of the Great Lakes in 30 years, and how they best felt they could reach that vision. While some were general and included overall goals, many listed specific steps they felt citizens could take to help in the restoration process.

The contribution of the students and officials participating in the education conference was recognized by Acting Canadian Chair E. Davie Fulton on behalf of the Commission during the Biennial Meeting's final plenary session Friday afternoon. Six students reported to meeting attendees on steps they and their colleagues had already taken since the education conference to ensure the future of the Great Lakes. Their comments reflected the sentiments of other students who attended the conference, who stressed that, indeed, they *could* make a difference in the future of the Great Lakes, both individually and collectively.

NEW LAW BANS SALE AND USE OF HIGH PHOSPHATE DETERGENTS IN PENNSYLVANIA

by Stephen J. Curcio

When Pennsylvania Governor Robert P. Casey signed the Phosphate Detergent Act (Act 31) into law on July 5, 1989, the commonwealth committed itself to further reduce the phosphate load deposited into Lake Erie from Pennsylvania waters.

"This new law underscores Pennsylvania's commitment to join neighboring states in protecting the Chesapeake Bay, Lake Erie and the Ohio River as regional and natural resources," Casey said as he announced the passage of Act 31. Great Lakes and mid-Atlantic states have already imposed similar bans to protect water quality of affected watersheds, and the legislation allows Pennsylvania to meet its goals as established in the 1978 Great Lakes Water Quality Agreement.

Pennsylvania has approximately 50 miles of Lake Erie shoreline. Its share of the Lake Erie watershed includes half of Erie County and approximately one-fourth of Crawford County, totalling almost 1,716 square km (660 square miles). This is a small area compared to the rest of Pennsylvania's 117,866 square km or 45,333 square miles, in which most of the surface waters flow toward the Ohio River, the Delaware River, or into Chesapeake Bay.

The Pennsylvania phosphate law calls for a fine of up to $100 for use of detergents which exceed phosphate limits of 0.5 percent, and up to $1,000 for sales and manufacturing violations. The ban will take effect March 1, 1990 in 45 counties in the Lake Erie and Susquehanna River watersheds, and one year later in the state's remaining 22 counties. In order to successfully introduce and pass phosphate legislation, it was essential that both watersheds be included in the bill.

In addition to the passage of Act 31, two other Great Lakes initiatives recently have been implemented by the commonwealth. In September 1988, Governor Casey announced that he had joined the Council of Great Lakes Governors and was appointing a full-time Great Lakes coordinator in Pennsylvania's Department of Environmental Resources (DER). This coordinator will assist others in the state and region to develop policies, programs and procedures.

"This new law underscores Pennsylvania's commitment to join neighboring states in protecting the Chesapeake Bay, Lake Erie and the Ohio River as regional and natural resources"

Other water quality issues continue to be at the forefront of Pennsylvania's environmental agenda. Earlier this year, Governor Casey supported the introduction and passage of a state Great Lakes Protection Fund Act, which enables Pennsylvania to participate in the $100 million endowment fund created by the Council of Great Lakes Governors. This act has been signed into law and $1.5 million will be contributed to the protection fund.

Pennsylvania Representative Pete Wambach, left, Jeff Cory, standing, and Senator Noah Wenger at right watches as Governor Robert Casey signs the state's phosphate act.

The Pennsylvania Constitution guarantees that the state's residents have "a right to clean air, pure water and to the preservation of the natural, scenic, historic, aesthetic values of the environment." Through special programs to identify and protect Pennsylvania's scenic waterways, including resources like the Lake Erie coastline, the commonwealth continues to recognize that environmental rights and responsibilities are not limited to state boundaries.

For more information about Pennsylvania's phosphorus detergent ban, contact Steve Curcio, Community Relations Coordinator, Pennsylvania Department of Environmental Resources, Meadville Regional Office, 1012 Water Street, Meadville, PA 16335-3494. (814)332-6945.

BRIEFS

During the first visit by a delegation of US governors to Canada, commitments to new initiatives in environmental protection and economic development were made. A formal declaration of friendship and cooperation between the eight Great Lakes states and the provinces of Ontario and Québec was signed under a **Great Lakes Border Compact.** The compact includes provisions for an annual Great Lakes Policy Roundtable between the leaders, and it formally acknowledges that the states and provinces have shared resources and responsibilities to develop strong bonds for trade, commerce and cultural, recreational and human resources. Wisconsin Governor Tommy G. Thompson will serve as lead governor for the group for two years.

The governors also signed a **Great Lakes Oil Spill Control Strategy Agreement** in late July, which commits the states to work together in preventing and responding to oil spills in the lakes. Each state will incorporate oil spill control strategies into its environmental management plan, and coordinate identification of potential sources of spills with the US and Canadian Coast Guards.

For more information about the governors' trip to Canada and the compact, contact the Council of Great Lakes Governors, 310 S. Michigan Avenue, Tenth floor, Chicago, IL 60604. (312)427-0092.

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In the July/August issue of *Focus*, we included a photograph of two turtles with the article on the Cause-Effect Linkages Workshop (Volume 14, Issue 2, page 6). The photo was taken by Christine Bishop of the National Water Research Institute, who has completed several studies on certain snapping turtle populations. She reports that the caption for the photograph should have identified the turtles as deformed *hatchling turtles*, rather than embryonic deformities. Also, the deformities could have resulted from other chemicals found in that particular set of turtles, such as pesticides and 2,3,7,8-TCDD, not just PCBs. We apologize for the error in the caption.

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According to preliminary cost data compiled by the Northeast-Midwest Institute, cleaning up just ten of the Great Lakes basin's Areas of Concern could cost as much as three billion dollars. The report, **Cleaning Up Great Lakes Areas of Concern: How Much Will It Cost?**, describes the type of pollutants found in the Areas of Concern, the needed changes in remediation and the projected cleanup costs. It also specifically recommends that Congress instruct the US Army Corps of Engineers to give more weight to environmental concerns when deciding whether to dredge and remove contaminated sediments; the Clean Water Act be fully funded and alternative funding mechanisms be pursued for cleanup; and monies obtained from US Clean Water Act enforcement actions be applied to specific water quality restoration measures.

Copies of the report are available from the Northeast-Midwest Institute, Center for Regional Policy, 218 D Street SE, Washington, DC 20003. (202)544-5200.

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Michigan Governor James Blanchard has created a new **Council on Environmental Quality** to track trends in the state's environment, provide a forum to develop innovative policies and legislation, and develop a "citizen stewardship" program to educate and activate citizen responsiveness to environmental concerns. The council's membership includes representatives from state departments, industry, citizen organizations and others involved in environmental protection. It is chaired by East Michigan Environmental Action Council Executive Director Elizabeth Harris.

The council's first major project is to produce a "state of the environment" report by April 1990 that will assess past and present conditions, programs and policies; identify emerging issues; and propose new policies and areas of research. For further information, contact David Dempsey, Council on Environmental Quality, Michigan Department of Public Health, P.O. Box 30195, Lansing, MI 48909 or telephone (517)335-8646.

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Congratulations are extended to **Dr. Gary Foley**, US member of the IJC's International Air Quality Advisory Board, who was recently appointed director of the US Environmental Protection Agency's Atmospheric Research and Exposure Assessment Laboratory. The new laboratory was developed when the Environmental Monitoring System Laboratory, which Foley directed, was combined with the Atmospheric Sciences Research Laboratory. The new facility is located in Research Triangle Park, North Carolina.

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1992 will be the **"Year of Clean Water,"** thanks to a joint resolution in Congress to pay tribute to the 20th anniversary of the 1972 US Clean Water Act. The steering committee to plan events and programs between October 1989 and October 1992 includes representatives from more than 60 national organizations, as well as several national political leaders. Programs will be developed to increase public awareness and support for clean water initiatives through local cleanup campaigns and water festivals, development of clean water units for use in schools, world water summits and national technology symposia, and celebration of the Clean Water Act through waterfront festivals, fairs and exhibits.

America's Clean Water Foundation will oversee development of these and other programs. For details, contact the foundation at 444 N. Capitol Street NW, Suite 330, Washington, DC 20001. (202)624-7782.

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Don't be surprized if you turn on the television and see **Dr. Jack Vallentyne**, Canadian co-chair of the IJC's Great Lakes Science Advisory Board, on the screen one evening. Vallentyne is providing an introduction before each of the eight hour-long programs of an encore broadcast of the series, **Fragile Nature: The Miracle Planet.** The program chronicles the geological history of the earth, and can be seen each Friday

evening at 9 p.m. from October 27 through December 15 on TV Ontario.

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Perspectives in Science is a new series of three, one-hour interactive videotapes exploring issues in science, technology and society. The series' goal is to show students how science applies to and affects their daily lives, and how they can access and understand the information they will need to make moral and ethical choices in a highly technological world. The program is directed at students in grades 7 through 10 in science and social studies courses.

The series is available from the National Film Board of Canada D-10, P.O. Box 6100, Station A, Montreal, PQ H3C 3H5. The purchase price in Canada is $249 plus applicable sales tax. For US purchase or information please contact the National Film Board of Canada, 1251 Avenue of the Americas, 16th floor, New York, NY 10020.

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The Union québécoise pour la conservation de la nature (UQCN), in collaboration with nine other environmental organizations, have formed a program called **Stratégies Saint-Laurent** (SSL). This group will be devoted to increasing public awareness and creating committees to work on specific issues affecting the St. Lawrence River, and will involve citizen organizations and other interested parties. SSL will also produce status reports for the major regions of the river.

To obtain more information on the program contact Harvey Mead, President, UQCN, 160, 76e Rue Est, Charlesbourg, PQ G1H 7H6 (418)652-1267 or Christian Simard, Coordinator of SSL at (418)628-9600.

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Almost 28,000 ha (70,000 acres) of shoreline along lakes Superior and Michigan have been designated critical sand dune areas by the State of Michigan. In bills passed recently by the state legislature, the new law provides special zoning protections for the areas and requires associated local units of government to formulate zoning ordinances to regulate development. Oversight responsibilities are given to the Department of Natural Resources according to the slope of the dunes, the likelihood of increased erosion, and whether the site has been determined to be essential to the ecology of the overall critical dunes area. The local governments will have until June 30, 1990 to adopt local ordinances to meet the law's requirements.

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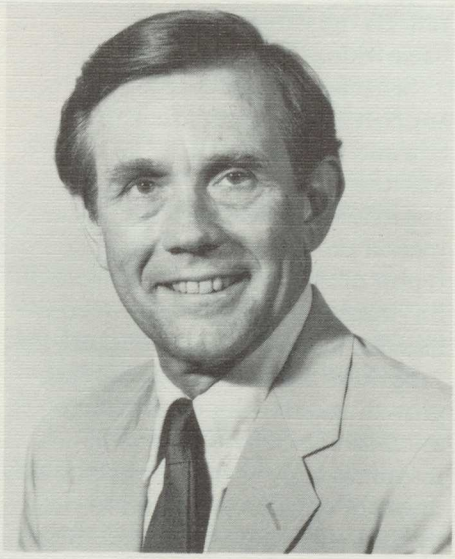

Dr. Theodore C. Moore, Jr. has been named director of the University of Michigan's new **Center for Great Lakes and Aquatic Sciences**, created by the University's Regents in 1988. Moore received a B.S. degree in geology from the University of North Carolina and a Ph.D. in oceanography from the Scripps Institution of Oceanography. He has taught at Oregon State and Rhode Island Universities.

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A bill aimed at reducing the amounts of hazardous wastes generated by industry has been chosen as model legislation by the Suggested State Legislation Committee of the Council of State Governments. The model bill includes a goal for reducing wastes, mandatory industrial waste reduction plans, a technical assistance program and fees for generated wastes. The bill combines parts of legislation from Kentucky, Oregon, North Carolina, New York and Minnesota.

For copies of the model legislation, contact R. Steven Brown, The Council of State Governments, P.O. Box 11910, Lexington, KY 40578-9989. (606)231-1882.

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Carlos Fetterolf, executive secretary of the Great Lakes Fishery Commission in Ann Arbor, Michigan, has been elected second vice-president of the American Fisheries Society, the world's oldest and largest organization of fisheries science professionals. Fetterolf will serve as an officer of the society for the next three years before assuming the presidency in 1992.

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Ebb Tide for Pollution: Actions for Cleaning Up Coastal Waters is the latest report outlining actions to reverse degradation of coastal waters — including the Great Lakes — from various types of pollution. The Natural Resources Defense Council's (NRDC) report states that more than seven trillion gallons of sewage are dumped into US coastal waters each year by industries and municipal sewage treatment plants. In addition, oil spills, medical waste, dredge spoils, garbage, and urban and agricultural runoff multiply the effects of pollution on water systems.

The report outlines six key elements to the council's plan to reverse these figures. They include eliminating all combined sewer overflows, placing tighter limits on industrial discharges, banning new discharge permits until the requestor has proven that all waste reduction technology has been installed, increased controls on coastal development, full funding of coastal projects as authorized by water quality laws, and phasing out waivers under the Clean Water Act which allow more than 40 coastal sewage treatment plants to use only primary treatment technology.

Copies of the report can be obtained for $7.50 (prepaid US funds) from NRDC, 1350 New York Avenue SE, Washington, DC 20005. (202)783-7800.

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SAB COMMITTEE REQUESTS INPUT FOR ETHICS PROJECT

by Peter Boyer

The Societal Committee of the Science Advisory Board (SAB) provides advice to the Board on all aspects related to human uses of the Great Lakes within the context of the Great Lakes Water Quality Agreement. Within this mandate, the committee has begun a project to advise the Board and Commission on the relevance and emergence of an ecosystem ethic for the Great Lakes basin. This builds on the work discussed in the 1987 Board report on anticipatory, preventive and adaptive strategies.

The importance of an ecosystem ethic is related to the extent to which societal principles and values move beyond an anthropocentric focus to include the relationship of humans within the rest of the natural system. Many professions, organizations and governmental bodies in both the United States and Canada have adopted an ethic or code of conduct which reflects their commitment to a broader relationship between humans and the surrounding ecosystem.

As a part of the project, the committee contracted the services of Jame Schaefer, a consultant on environmental conflict resolution strategies who is studying for a doctoral degree in environmental ethics at Marquette University in Milwaukee, Wisconsin. Her discussion paper describes the many initiatives and developments which indicate the emergence of an ecosystem ethic. In particular, she examines indicators related to academia, Native people, religious and non-governmental secular organizations, government, foundations and the public as measured through polls and survey techniques. She recommends a process to facilitate the creation of an ethical code, which is based on the ecosystem approach language of the Agreement and reflects the values of society basinwide.

Schaefer also notes the growing support in the policy arena in Canada and the United States to recognize the importance of ethical approaches in dealing with environmental problems. In Canada, the report of the National Task Force on Environment and Economy recommended actions which recognize the "absolute" necessity of promoting growth and development which assures "that the utilization of resources and the environment today does not damage prospects for use by future generations." In addition, roundtables of representatives from government, industry, labour, education and the public sector are being held throughout Canada to identify specific steps to encourage and facilitate sustainable development. Among the initiatives recommended by a national forum organized by the Harmony Foundation was the implementation of "a new sustainable development ethic for Canada" by churches, government and all other sectors reflecting "the need for stewardship of air, water, land and all living organisms."

The need for an environmental ethic has also been acknowledged in the United States. President Bush has indicated that "one goal of [his] presidency would be to lead America toward a greater 'conservation ethic' — a greater understanding that a clean and protected environment is essential to our public health, to our continued enjoyment of the outdoors, to our economic development, and ultimately to our quality of life. Most important, we owe it to our children and grandchildren to leave them a planet that is better than we found it."

The Societal Committee is interested in receiving comments and input on the emergence of an ecosystem ethic from individuals and organizations, and will make available Schaefer's paper, "Toward an Ethic for the Great Lakes Basin Ecosystem," on request to those who wish to submit input. Those interested in submitting comments might wish to consider, but not be limited to, the following issues:

- How would the definition of an ecosystem ethic enhance progress and implementation of the Agreement?
- Which of the major elements of an ecosystem ethic are most important to the Great Lakes Basin Ecosystem and implementation of the Agreement?
- What process could best be used to develop or reach consensus on an ecosystem ethic for the Great Lakes basin?

Please forward submissions to the attention of Societal Committee Secretary Peter C. Boyer, International Joint Commission, 100 Ouellette Avenue, Eighth floor, Windsor, ON N9A 6T3, or in the US to P.O. Box 32869, Detroit, MI 48232-2869. In Canada, call (519)256-7821 and in the US call (313)226-2170.

WATER LEVELS STUDY DISCUSSED ON THE AIR...

Commissioners Robert Welch, left, and Gordon Durnil, centre, answer telephone calls during the morning broadcast. Credit: Frank Bevacqua

by Frank Bevacqua

In an innovative experiment aimed at communicating with a larger segment of the Great Lakes-St. Lawrence River basin community and other audiences throughout North America, the International Joint Commission (IJC) convened a videoconference on October 14, 1989 to discuss issues related to its study of fluctuating water levels in the Great Lakes and St. Lawrence River basin.

The purpose of the videoconference was to stimulate public input as the Commission considers the work accomplished in phase one of the study and deliberates on plans for the second and final phase. "If people don't have a role in the study effort, not only today, but on an ongoing basis, we will not succeed," stated David LaRoche, a member of the study's Project Management Team and co-organizer of the event.

Building on experience gained from a videoconference held one year ago, the Commission — along with many others in the community — encouraged local cable television stations to bring the broadcast directly into people's homes. It was hoped that this method would reach more people than organizing local meetings to view the broadcast, as had been done for the first videoconference.

At least 40 to 50 cable stations from Kingston to Duluth and one commercial station carried the program live. While it is impossible to determine the number of viewers with certainty, estimates range in the tens of thousands based on the subscriber audience and standard viewership for Saturday morning cable broadcasts. In addition, the broadcast was publicized by two large direct mailings and a video news release. One-hundred-forty viewers took advantage of the toll-free telephone numbers to request reports or speak directly with IJC Commissioners, members of the study Project Management Team (PMT) and representatives from the hydropower industry, environmental and shoreline resident organizations, the recreational boating sector, as well as state and provincial governments who were present at the broadcast studio in Hamilton, Ontario. Some of the callers also participated in live, on-air discussions.

The broadcast was moderated by Canadian journalist Everett Banning, the executive producer and host of *Canada Business Week*. The program included a prerecorded videotape on issues related to fluctuating water levels and a lively discussion among studio guests. The agenda for the discussion, however, was primarily set by the telephone calls coming from inside and outside the Great Lakes basin, including Arizona, California and British Columbia.

PMT Canadian Co-Chair Tony Wagner noted that, "The calls themselves really exemplify the problem ...with what may be the most intensive and largest reference the Governments have ever given the Commission." Reacting to a statement that regulation of levels in one part of the system would transfer problems to another part of the system, one caller objected that "if this is to be a systemwide study, then

Broadcast moderator Everett Banning questions PMT members Doug Cuthbert, Bob Roden and Michael Ben-Eli. Credit: Frank Bevacqua

LAKE LEVELS UPDATE

Everett Banning discusses the issues with David Crombie, Royal Commission on the Toronto Waterfront, Sharon Hazen of the International Great Lakes Coalition and Dave Newhouse of the National Audubon Society. Credit: Frank Bevacqua

we should be looking at moving water out of Lake Erie at the same time that flows out of lakes Michigan and Huron are being increased." Study PMT US Co-Chair General Ted Vander Els responded that, "It is the strong recommendation of the co-chairs that this be looked at in phase two of the study."

Duncan McCracken of the International Great Lakes Coalition called to ask whether the ecosystem perspective taken by the phase one report was confusing the issue. "The implications for the ecosystem will always be unclear until you have a specific proposal before you. I propose that managing the lakes to their annual long-term averages be examined as the goal for regulation and that we examine the effects on the ecosystem of that proposal," he said.

One caller from St. Catharines, Ontario noted that the various actions which affect water levels in the basin are not coordinated by a central agency and asked if the study planned to address this problem. Study team member Michael Ben Eli replied that the issue of governance was a central concern of the study.

The telephone calls to the studio peaked at various points during the broadcast. One item which seemed to light up the phones was a call from a person in Arizona stating that they had a shortage of water in their region, but no shortage of people. "It seems that in the Great Lakes you want to keep the 'big canteen' to yourselves, but what about us and folks in other areas such as the lower Mississippi? Are you looking beyond the Great Lakes region in your study?" Calls increased dramatically at another point when it was announced that the IJC Commissioners would be answering the phones.

Discussions are now underway for the Commission to convene a discussion of the levels study early next year for French speaking Canadians, though the timing and means to convene the discussion have not yet been determined.

...AND FACE TO FACE

Following the videoconference, discussion of the fluctuating water levels study continued through the afternoon of October 14, 1989 at a public meeting convened by the Commission at City Hall in Hamilton, Ontario. His worship Robert Morrow, Mayor of Hamilton, welcomed all meeting participants to the nearly full City Council Chambers. The IJC Commissioners and nearly all study Project Management Team members were on hand to listen to people's views and respond to questions. Statements were made by 32 persons representing shoreline property and business interests, environmental interests, native interests, the Province of Québec and downstream interests.

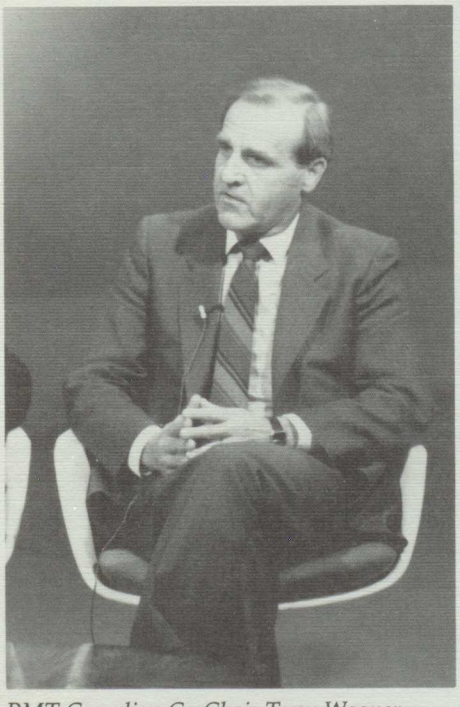
Cliff Sasfy, former president of the International Great Lakes Coalition, called for greater public involvement in phase two of the study, a theme which was sounded frequently during the afternoon. "The last time we had an opportunity to provide comment, there was no substance to comment on," he said. "I don't only want to be a player at the end of the game." Sasfy also questioned why structural measures to control water levels were not investigated to the same extent as other issues.

Great Lakes United Executive Director Phil Weller stated that his organization opposes new diversions of water out of the Great Lakes as well as additional structures to control lake levels. He emphasized that, as the title of the phase one

LAKE LEVELS UPDATE

progress report suggests, we should learn to live with the lakes. Frederick Brown, past president and present board member of Great Lakes United, pointed out that substantial resources would be required to study methods to control Great Lakes water levels. He asked whether the Commission set priorities between this issue and public health when requesting study funds. Brown also felt that greater public involvement in phase two was necessary.

Sharon Hazen, president of the International Great Lakes Coalition, characterized the day as a milestone in terms of communication and congratulated the IJC for its efforts. She presented the coalition's press release, which stated that the phase one report did not respond to the reference from Governments in any meaningful fashion. The effects of low water on toxic pollution problems is also a matter of concern, according to Hazen.



PMT Canadian Co-Chair Tony Wagner answers a question during the videoconference. Credit: Frank Bevacqua

Wisconsin Great Lakes Coalition Chapter member Robert Ozanne thanked the study team for their work, but felt that conclusions had been drawn before the work was complete. "Until you can examine the benefits of regulating the full Great Lakes system, how can you conclude that the costs are extremely high?" Bill Weismuller, chair of the Wisconsin Chapter, asked how he could offer his services to the Commission. Commission US Chair Gordon Durnil replied that the IJC would welcome concrete suggestions regarding how the public should be involved in the phase two effort.

Representing the City of Gilbralter, Michigan, George Read suggested that Lake Superior should not be regulated at the expense of downstream lakes, and that Lake Superior should be required to accept their fare share of extreme water levels. Later in the afternoon, Howard Rummel of the Whitefish Bay Property Owners Association in Paradise, Michigan expressed dismay that anyone would suggest that Lake Superior be regulated to a higher level and asked, "Does someone want to make a storage tank out of that beautiful body of water?"

David Rebmann of the South Shore Coalition in Blasdell, New York observed that the phase one report emphasized the differences between the various interests in the Great Lakes basin rather than their common interests. "I would like to see us get beyond this type of thinking," he said. "If you brought the Lake Superior and downstream interests, the environmentalists and riparians, and the other interests as well, together in the decisionmaking process, I believe that the degree of consensus we would be able to reach might surprise you."

You are Invited to Comment

You are invited to comment on the results of phase one and what should be done in the second and final phase of the Commission's study of measures to alleviate the adverse consequences of fluctuating levels in the Great Lakes and St. Lawrence River basin. The Commission is reviewing the work of phase one and deliberating on plans for phase two. Please send your comments to either of the addresses below prior to December 15, 1989.

David LaRoche Secretary IJC 2001 S St. NW, Second floor Washington, DC 20440	Philip Slyfield Secretary IJC 100 Metcalfe St. 18th Floor Ottawa, ON K1P 5M1

Living with the Lakes: Challenges and Opportunities, a progress report to the International Joint Commission, is available on request along with executive summaries of annexes. The progress report highlights the findings of the study Project Management Team based on the phase one study effort and the annexes provide detailed information regarding the investigations by study working groups. The full text of the seven annexes may be examined at approximately 150 locations throughout the Great Lakes basin. For further information, or to obtain a copy of the report and executive summaries, call the International Joint Commission in Washington at (202)673-6222, in Ottawa at (613)995-2984, or write to either of the addresses above.

LAKE LEVELS UPDATE

Below Average Precipitation on Lakes During Summer '89

While the summer started with rainfall well above average in June, below average precipitation levels were recorded in July, August and September. Lake Ontario received 60 percent more than normal rainfall in June, while the remaining lakes were at least ten percent above average.

The higher precipitation levels helped to keep the lower three Great Lakes at above average levels despite substantially below average rainfall in July and August. The basin received only 4.1 cm (1.6 inches) of precipitation in July (compared with a normal level of 7.9 cm or 3.1 inches), and in August all the lakes received 85 percent of normal precipitation except Lake Ontario, which received just 60 percent of normal rainfall.

By early September, all of the lakes were declining at normal seasonal rates. While levels in the lower Great Lakes were slightly above average by the end of September, lakes Superior and Michigan-Huron had approached their long-term averages as a result of below average precipitation during six of the first nine months of 1989.

1989 GREAT LAKES LEVELS

Lake	Recorded	Level Max/Year	Min/Year	Long-Term Average (1900-1988)
		JUNE		
Superior	600.80	601.77/1986	598.63/1926	600.71
Michigan-Huron	578.56	581.07/1986	575.90/1964	578.72
St. Clair	574.59	576.51/1986	571.74/1934	573.98
Erie	571.96	573.70/1986	568.46/1934	571.19
Ontario	246.26	248.06/1952	242.91/1935	245.62
		JULY		
Superior	600.91	600.91/1986	598.99/1926	600.92
Michigan-Huron	578.62	581.27/1986	575.96/1964	578.85
St. Clair	574.65	576.56/1986	571.88/1934	574.05
Erie	571.92	573.66/1986	568.46/1934	571.14
Ontario	246.17	247.74/1947	242.75/1934	245.52
		AUGUST		
Superior	600.84	602.04/1986	599.15/1926	601.03
Michigan-Huron	578.50	581.34/1986	575.97/1964	578.80
St. Clair	574.37	576.45/1986	571.60/1934	573.93
Erie	571.54	573.37/1986	568.36/1934	570.95
Ontario	246.51	247.45/1947	242.26/1934	245.17
		SEPTEMBER		
Superior	600.78	602.06/1985	599.46/1926	601.06
Michigan-Huron	578.26	581.26/1986	575.94/1964	578.64
St. Clair	574.19	576.31/1986	571.36/1934	573.72
Erie	571.23	572.96/1986	568.23/1934	570.65
Ontario	245.03	246.91/1947	241.94/1934	244.74

PREVENTING BALLAST WATER INTRODUCTIONS IN THE GREAT LAKES

by Margaret A. Dochoda

Ballast water of ocean-going vessels has often been presumed to be responsible for certain plant and animal species introductions in the Great Lakes in recent years. Such introductions are largely innocuous and difficult to attribute with certainty to ballast water. Three recent European arrivals, however (ruffe, spiny water flea or BC, and zebra mussel), are different in that they have the potential to be extremely damaging to the ecosystem. Further, it is difficult to conceive how, other than in ballast water, the ruffe could have traversed the Atlantic — certainly not on bird's feet as has been suggested for some other exotic species found in the Great Lakes.

The potential risks posed to the Great Lakes by these three recent arrivals are several. The zebra mussel *(Dreissena polymorpha)* firmly attaches itself to any solid surface such as spawning reefs, boats and water intake pipes, impairing their use. Its filter feeding pattern may remove algae from the water, thus impacting the food chain at the lowest levels. The mussel is spreading rapidly from its current range in lakes St. Clair and Erie, and threatens to be costly to remove from pipes and other surfaces for industries and cities that draw their water from the Great Lakes.

The probable impact of the BC or spiny water flea *(Bythotrephes cederstroemi)* remains the subject of study and debate among scientists. As a predaceous planktonic crustacean that preys on smaller organisms such as *Daphnia*, the flea has the potential to reduce the food supply for larval fish, and to reduce water clarity. BC has been found throughout the Great Lakes.

The ruffe *(Gymnocephalus cernuus)*, a European relative of the perch, has little sport or commercial value. In Europe the ruffe preys on the eggs of whitefish, significantly depressing the abundance of the latter in some instances. Like the zebra mussel and BC, the ruffe is a prolific animal and can rapidly dominate yellow perch populations through competition. The ruffe's range is currently limited to the western end of Lake Superior.

The potential for eradicating exotic organisms, once established in large systems such as the Great Lakes, is next to nil. The experience of the Great Lakes Fishery Commission (GLFC) in such efforts provides a good example. Established in 1955 with responsibility to eradicate or minimize the exotic sea lamprey, the GLFC has only been able to achieve reasonable control of the lamprey's numbers and range. The ruffe, zebra mussel and BC will still be causing problems and will likely spread beyond the Great Lakes basin long after nature has repaired the damage from another contemporary shipping catastrophe, the Exxon

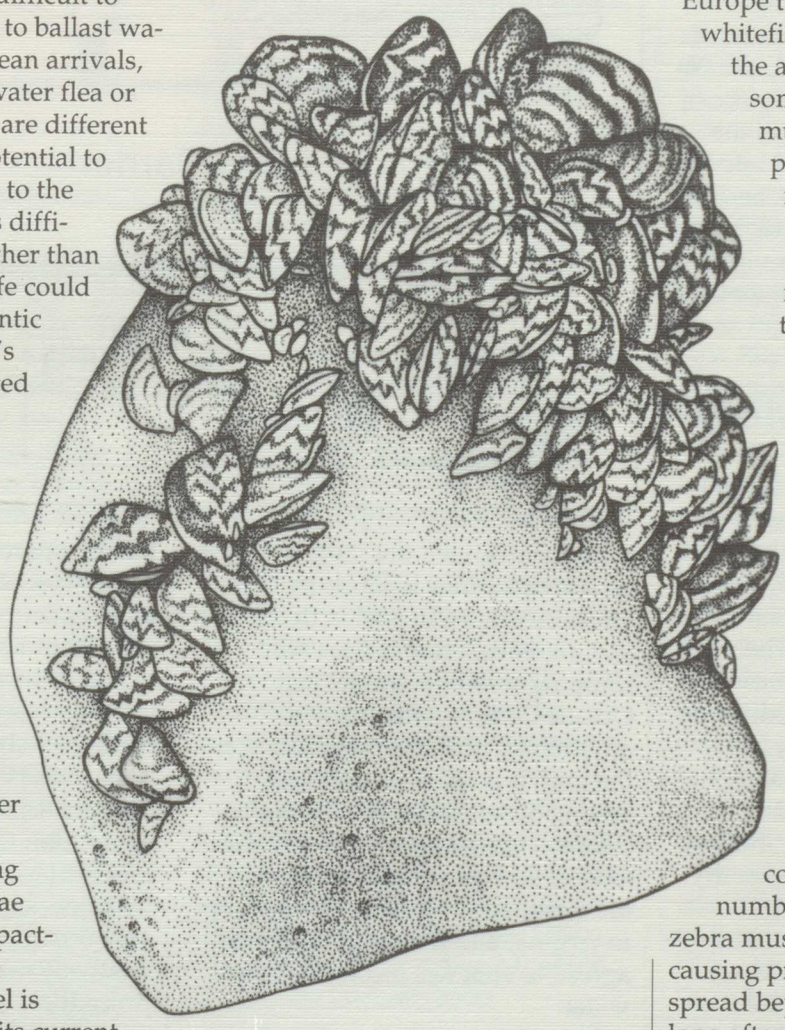


Illustration of zebra mussels. Credit: Margaret Van Bolt

Valdez oil spill. Thus with exotics the best medicine is *prevention*.

Ballast Water as a Vector

One reason why the role of ballast water in transporting organisms was not clearly established earlier is because the water is taken on and, for the most part, discharged below the waterline. Ocean-going ships carry as much as 4.75 million litres (1.25 million gallons) of ballast water when they are travelling without cargo. In the last ten years, as many as 1,100 ocean-going vessels have entered the Great Lakes annually; of these, as many as 600 per year are "in ballast," or carrying water in place of cargo. Researchers believe that the zebra mussel was introduced into the Lake St. Clair system in 1986, and the ruffe into Duluth Harbor in 1983. BC was first noted in Lake Huron in 1984, but when and how frequently it was introduced before then is difficult to determine.

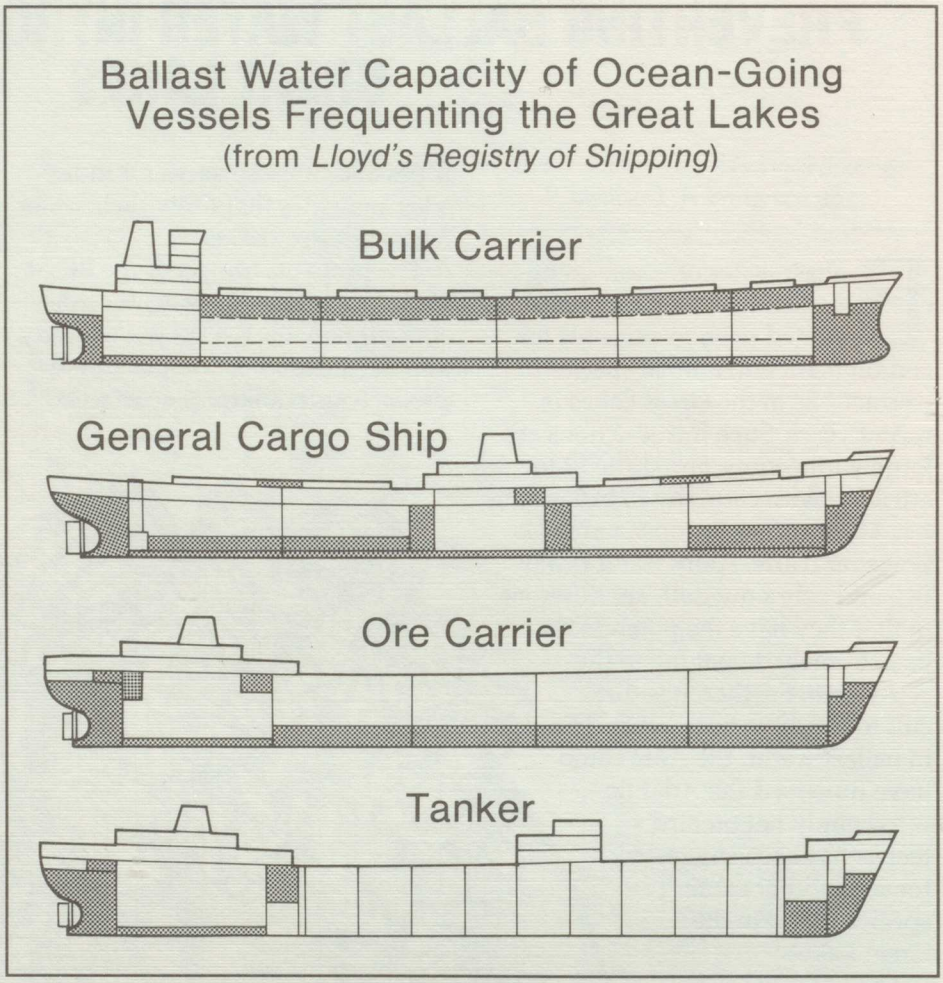
Preventing Introductions via Ballast Water

The most effective effort to date to prevent further introductions of harmful exotics came from the US and Canadian Coast Guards, acting under the amended 1978 Great Lakes Water Quality Agreement. The Canadian Coast Guard, in consultation with the US Coast Guard, the St. Lawrence Seaway Authority, shipping associations, Fisheries and Oceans Canada, Environment Canada and the Great Lakes Fishery Commission, established voluntary guidelines effective May 1, 1989.

These guidelines request that ships entering the seaway first exchange their ballast off the continental shelf (i.e. at depths greater than 2,000 m or 2,186 yards). If this is not possible for reasons of safety or because coastal ships have not left the shelf, the ballast water may be exchanged in the Laurentian Channel in the Gulf of St. Lawrence. Prior to the 1990 shipping season, Fisheries and Oceans Canada will review the advisability of exchanging ballast in the gulf. It is believed that little mixing occurs between Laurentian Channel waters and the rest of the Gulf of St. Lawrence. Ship masters are expected to confirm the exchange in writing, and the Coast Guard has agreed to spot test incoming ballast water.

The primary objective in exchanging ballast water for open ocean water is not to increase salinity; all but four percent of unexchanged ballast has been found to contain salt already, and many coastal organisms are tolerant of both salt and fresh water. Rather, it is to exchange coastal organisms for those which are less likely to survive and reproduce in the Great Lakes due to their intolerance to fresh water, their adaptation to open water, and their relative lack of abundance in terms of both species and absolute number. Mid-ocean ballast exchange is a relatively safe and cost effective procedure, which already has been occasionally practiced by shippers.

Several Great Lakes agencies are concerned that the area protected by



the guidelines (the seaway, upstream from Montreal) is not sufficient to protect the Great Lakes from invasion. Obviously, primary introductions which occur in the Great Lakes themselves must be a first concern, and these are addressed in the guidelines.

In addition to primary introductions, however, migration and secondary ballast water transfers from downstream ports such as Montreal, Québec City and Halifax are also possible. Three and four-spine sticklebacks are believed to have recently invaded the Great Lakes via ships traversing the St. Lawrence River. Certainly ruffe, BC and the zebra mussel could have made their way to the Great Lakes had they first been introduced at Montreal and Québec City.

Another concern is that shippers are not yet fully complying with the Canadian ballast exchange guidelines. Full compliance is necessary since one ship's ballast water can introduce species which may be devastating to other users of the water. The shipping associations have been cooperative thus far, and some ships began exchanging ballast water even before the guidelines came into effect. The Canadian Coast Guard will monitor the program to determine if it is effective without imposing enforcement penalties or other more burdensome preventive measures such as disinfection.

In the United States, Michigan Congressman Bob Davis and Dennis Hertel incorporated language into the fiscal year 1990 Coast Guard Reauthorization Bill requiring the Secretary of Transportation (Coast Guard) to consult with the departments of Interior (US Fish and Wildlife Service) and Commerce (National Oceanic and Atmospheric Administration) and the Great Lakes Fishery Commission prior to formulating recommendations to Congress to control the influx of exotic organisms into US waters (not just the Great Lakes) via ballast water. New York Congressman Henry Nowak also introduced a bill (HR 3403) in late fall which calls for ballast exchange to be a legal requirement in the US.

The Great Lakes are not alone in experiencing recent onslaughts of harmful ballast water introductions. Caged salmon in Norwegian waters were threatened by toxic algae transported by ballast water; Norway requested the United Nation's International Maritime Organization to require that all ships visiting the country's ports exchange ballast in order to not spread the algae. California's coastal waters are being invaded by large numbers of Asian organisms transported by ocean-going vessels, which can carry even more ballast water than those ships visiting the Great Lakes. Australia now regulates that ships exchange ballast water, since red tide organisms were imported into that country's waters.

Throughout the world we are learning that the damage effected by exotics more than warrants the simple preventive ballast exchange procedures being requested by agencies responsible for ecosystem management.

For more information about Great Lakes guidelines to prevent introduction of exotic species, contact Margaret Dochoda, Fishery Biologist, Great Lakes Fishery Commission, 1451 Green Road, Ann Arbor, MI 48105. Telephone (313)662-3209.

SAGINAW BAY'S NEW FRIENDS

by Dr. Brad Smith

The destruction of Saginaw Bay wetlands is unfortunately an all too familiar story. With each passing year, the plow, bulldozer or dredge claims more of the once seemingly endless coastal wetlands along the bay's 384 km (240 miles) of shoreline. During the past decade, Saginaw Bay has also been plagued by a continual barrage of related environmental disaster stories. News of PCB contaminated sediments, birth deformities in shorebirds, direct discharge of sewage, and fish consumption warnings have become daily headlines. It became apparent that Saginaw Bay had many problems, and unfortunately, it also seemed that the bay had few friends.

If the events of the past year are an indicator of the future, things may be changing for Saginaw Bay — especially where friends are concerned. During the past year, several organizations have emerged with wetlands preservation as their primary mission. In addition, there has been increased cooperation between existing organizations to educate the public about the importance of preserving the remaining fragile wetlands along the bay.

Providing a pivotal role in the educational programs focusing on the bay is the Jennison Nature Center located at the north end of Bay City State Park near Bay City, Michigan. The center is a combination wetlands museum, classroom, laboratory and meeting place. In any given year,

Young Children enjoy a visit to Jennison Nature Center to look for animals in nearby Tobico Marsh. Credit: Brad Smith

some 25,000 people visit the center, which is jointly operated by Delta College, Saginaw Valley State University and the Michigan Department of Natural Resources. Adjacent to the center is the 680 ha (1,700 acre) Tobico Marsh, named a national landmark in 1976. Tobico provides an excellent natural laboratory for teaching about the value and uniqueness of a wetland community.

While the environmental education programs at Jennison have been ongoing for several years, they have recently taken on a new perspective as a result of the involvement of the Foundations Outdoor Education Committee. The evolving program is designed to link together wetland areas along Saginaw Bay, beginning in northern Bay County and moving southward along the coast. Specific sites are being identified and incorporated into an environmental education program focusing on wetland habitats. The Jennison Nature Center and Tobico Marsh will serve as the centerpiece of this county-based wetland program.

During the past year, the foundation has been active in identifying resources that could be incorporated into the new program. In addition to a natural inventory of suitable wetland sites, the foundation has also been working with state, county and township governments to develop the project. A questionnaire was sent to area teachers and school personnel during summer 1989 to determine programs needs specifically around the wetland theme. Results of the survey have been valuable in the program's design, as have the staff from the Bay City State Park.

The summer of 1989 also brought another friend of Saginaw Bay into the process. This new ally is an outgrowth of the Saginaw River/Basin Remedial Action Plan (RAP). Recognizing the opportunity to pursue environmental quality goals beyond the RAP process, volunteers created an organization devoted to initiating widespread public involvement in the management of the Saginaw Basin's diverse resources. Thus the Saginaw Basin Alliance (SBA), a private nonprofit corporation, was born.

As required by its adopted bylaws, the Alliance will promote Saginaw Basin preservation, restoration, resource management, planning and development through basinwide citizen involvement and education. The SBA will raise funds for its activities through membership dues and public and private donations. Specific activities under consideration include:

- A basinwide water quality monitoring network staffed by high school students.
- An informational newsletter featuring up-to-date articles of interest to Alliance members.
- Public forums, workshops and seminars on critical basin issues.

In addition, the SBA plans to work closely with area schools to provide educational programs and is considering the possibilities of organizing an annual cleanup day for the Saginaw River or its tributaries similar to the successful annual Rouge River cleanup project in southeast Michigan. Perhaps the most promising outcome thus far of the SBA has been the willingness of area citizens to

become involved. The SBA is off to a good start and Saginaw Bay will benefit from its programs.

While it may be premature to say that Saginaw Bay's future is entirely promising, it is safe to say that help is on the way to educate the public about this valuable resource. It took several generations to damage the bay and it will likely take years to bring it back. With the development of a countywide wetlands educational program, expanded activities at the Jennison Nature Center and Bay City State Park, and the formation of the Saginaw Basin Alliance, the citizens of the area have embarked on the road to restore the bay's unique ecosystem.

For more information about the SBA or educational programs at the Jennison Nature Center, contact Dr. Brad Smith, Delta College, F209 Delta College, University Center, MI 48710. (517)686-9000.

Tobico Marsh. Credit: Brad Smith

EVENTS

INTERNATIONAL JOINT COMMISSION

Schedule of Meetings

The following includes upcoming meetings scheduled by the Commission and its various boards. Please contact an IJC office for further information.

November	8-10	IJC Executive Session Windsor, ON
	9	Restoration Subcommittee Burlington, ON
	16	Water Quality Board Lansing, MI
December	6- 7	Surveillance Subcommittee Windsor, ON
	6- 8	Science Advisory Board Milwaukee, WI
	13-14	IJC Executive Session Washington, DC
January	4- 5	Water Quality Programs Committee Windsor, ON
February	1	Water Quality Board Québec City, PQ
March	6- 8	Mass Balance Workshop Scarborough, ON

General Conferences

The Ontario Ministry of the Environment and the Pollution Control Association of Ontario are cosponsoring a one-day seminar on the **Fate of Chemicals in Sewage Treatment Plants** on November 23, 1989 at the Radisson Hotel in London, Ontario.

For further details on the seminar contact Sandra Davey, Pollution Control Association of Ontario, 10 Petch Crescent, Aurora, ON L4G 5N7 or telephone (416)841-1317.

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The Environment Show is Canada's first environmental trade show and congress to cover the full spectrum of environmental issues affecting water, soil and air. The conference will be held December 4 and December 5, 1989 at Toronto's Convention Centre in Toronto, Ontario.

The Congress is designed to strengthen linkages between environmental organizations, research institutions, regulatory authorities, municipal and industrial decisionmakers and manufacturers.

For more information on the conference contact The Environment Show and Congress, Suite 302, 4920 Dundas Street West, Toronto, ON M9A 1B6. (416)234-1240.

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Turning the Tide: Legislative Remedies for Troubled Waters is the subject of a national conference to be held in Seattle, Washington on December 4-5, 1989. The conference, sponsored by the Puget Sound Water Quality Authority, the US Environmental Protection Agency and the Washington Department of Ecology, is a chance to find out about models of state legislation and policy from around

the country and in particular from the Great Lakes, Chesapeake Bay and Puget Sound.

Workshop sessions will focus on legislative and policy accomplishments in such areas as wetlands, land use and growth, nonpoint source pollution, toxics and stormwater.

For more information, contact Wendy Watanabe at Puget Sound Water Quality Authority, 217 Pine Street, Suite 1100, Seattle, WA 98101. (206)464-7320.

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From December 11-15, 1989 a short course on **Time Series Modelling for Water Resources and Environmental Engineers** will be held at the University of Western Ontario in the Statistical and Actuarial Sciences Department. The main purpose of the course is to provide practical understanding and experience in the application of time series analysis techniques to riverflow and water quality data. This course is directed to water resources and environmental engineers working in government, consulting firms, universities and other organizations. Practical applications are used to demonstrate the usefulness and effectiveness of the time series techniques.

For further information and registration contact Ian McLeod at the University of Western Ontario, Statistical and Actuarial Sciences Department, London, ON N6A 5B9, telephone (519)661-3611.

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The American and Canadian Water Resources Associations are planning a joint meeting in Toronto on April 1-5, 1990 entitled **International and Transboundary Water Resources Issues**. Abstract proceedings will be distributed at the time of the symposium.

For more information about the planned conference contact Ken Reid at 5410 Grosvenor Lane, Suite 220, Bethesda, MD 20814-2192 (301)493-8600 or Craig Mather, the Metropolitan Toronto and Region Conservation Authority, 5 Shoreham Drive, Downsview, ON M3N 1S4. (416)661-6600.

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Earth Day, April 22, 1990, the anniversary of the first Earth Day in 1970, is an international celebration to launch a "decade of the environment." A coalition has been formed to plan local and global events that will publicize a worldwide demonstration of concern for the global environment. For information or to volunteer your help contact Dennis Hayes, Chairman, Earth Day 1990, P.O. Box AA, Stanford University, CA 94305.

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The Canadian Water Resources Association is presenting their **Forty-third Annual Conference** in Penticton, British Columbia on May 16-18, 1990. The objective of this conference is to provide a forum in which innovative approaches to river basin management can be discussed and evaluated.

For further information contact Mr. Robin McNeil, Program Chairman, 1990 CWRA Conference, c/o Water Management Branch, British Columbia Ministry of Environment, Parliament Buildings, Victoria, BC V8V 1X5 or telephone (604)387-9472.

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A three-day international conference organized by the US Environmental Protection Agency and the International Association for Clean Technology on **The Environmental Challenge of the 1990s** will be held on June 10-13, 1990 at the Omni Shoreham Hotel in Washington, DC. The international conference will provide an opportunity for those in government and business who make and implement decisions concerning pollution prevention to share their experiences and insight so that pollution prevention will evolve from national policy to worldwide practice.

All persons interested in attending the conference should contact Dr. Domenic Maio, Science Applications International Corporation, 8400 Westpark Drive, McLean, VA 22102. (703)821-4600.

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FOCUS
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